What is claimed is:

1. A method of inhibiting viable cells transplanted into a subject from being destroyed by the subject's immune system which comprises:
   a) containing the viable cells, or tissue comprising the viable cells, prior to transplantation within a device comprising a semipermeable membrane; and
   b) treating the subject with a substance which inhibits an immune-system costimulation event in an amount effective to inhibit the subject's immune system from responding to said contained cells or tissue.

2. The method of claim 1, wherein the substance is CTLA4.

3. The method of claim 1, wherein the device is a hollow fiber, a disc, or a sphere.

4. The method of claim 1, wherein the device is a microcapsule.

5. The method of claim 1, wherein the viable cells or the tissue comprising the viable cells are derived from a xenogeneic donor.

6. The method of claim 1, wherein the viable cells or the tissue comprising the viable cells are derived from an allogeneic donor.

7. The method of claim 1, wherein the viable cells or the tissue comprising the viable cells are derived from the subject.

8. The method of claim 7, wherein the viable cells are genetically engineered prior to transplantation into the subject.

9. The method of claim 1, wherein the subject is a human.

10. The method of claim 9, wherein the viable cells are derived from a mammal.

11. The method of claim 10, wherein the mammal is a human.

12. The method of claim 1, wherein the subject is a domesticated animal.

13. The method of claim 12, wherein the domesticated animal is a cow, a calf, a pig, a sheep, a lamb, a horse, or a chicken.

14. The method of claim 12, wherein the viable cells comprise cells which secrete a hormone which promotes growth in the domesticated animal.

15. The method of claim 1, wherein the viable cells comprise cells which secrete a biologically active substance.

16. The method of claim 15, wherein the cells which secrete a biologically active substance are endocrine cells.

17. The method of claim 16, wherein the endocrine cells are insulin-producing cells, hepatocytes, parathyroid cells, or pituitary cells.

18. The method of claim 15, wherein the cells which

secrete a biologically active substance are neuroectodermal cells.

19. The method of claim 18, wherein the neuroectodermal cells are adrenal cells or lymphocytes.

20. The method of claim 1, wherein the semipermeable membrane is impermeable to immunoglobulins and/or lymphocytes.

21. The method of claim 2, wherein treating the subject with CTLA4 comprises administering soluble CTLA4 to the subject.

22. The method of claim 21, wherein the soluble CTLA4 is CTLA4Ig.

23. The method of claim 1, wherein inhibiting the subject's immune system from responding to said contained cells or tissue comprises inhibiting production of immunoglobulins and activated macrophages capable of reacting with the viable cells or tissue.

24. A method of treating diabetes in a subject which comprises:

a) containing viable insulin-producing cells, or tissue comprising viable insulin-producing cells, within a device comprising a semipermeable membrane so as to obtain contained viable insulin-producing cells;

b) transplanting contained viable insulin-producing cells obtained in step (a) into the subject in an amount effective to treat diabetes in the

subject; and

c) treating the subject with a substance which inhibits an immune-system costimulation event in an amount effective to inhibit the subject's immune system from responding to an amount of contained viable insulin-producing cells according to step (b).

25. The method of claim 24, wherein the substance which inhibits an immune-system costimulation event is CTLA4.

26. The method of claim 24, wherein the tissue comprising the viable insulin-producing cells comprises pancreatic islet tissue.

27. The method of claim 24, wherein the viable insulin-producing cells comprise cells which have been genetically engineered prior to transplantation to secrete insulin.

28. The method of claim 24, wherein the device is a hollow fiber, a disk, or a sphere.

29. The method of claim 24, wherein the device is a microcapsule.

30. The method of claim 24, wherein the viable insulin-producing cells or the tissue comprising the viable insulin-producing cells are derived from a xenogeneic donor.

31. The method of claim 24, wherein the viable insulin-producing cells or the tissue comprising the viable insulin-producing cells are derived from an allogeneic donor.

32. The method of claim 24, wherein the viable insulin-producing cells or the tissue comprising the viable insulin-producing cells are derived from the subject.

33. The method of claim 32, wherein the viable insulin-producing cells are genetically engineered to secrete insulin prior to transplantation into the subject.

34. The method of claim 24, wherein the subject is afflicted with insulin-dependent diabetes mellitus.

35. The method of claim 34, wherein the subject is a mammal.

36. The method of claim 35, wherein the subject is a human.

37. The method of claim 24, wherein the subject is a mammal.

38. The method of claim 37, wherein the subject is a human.

39. The method of claim 24, wherein the semipermeable membrane is impermeable to immunoglobulins and/or lymphocytes.

40. The method of claim 25, wherein treating the subject with CTLA4 comprises administering soluble CTLA4 to the subject.

41. The method of claim 40, wherein the soluble CTLA4 is CTLA4Ig.

42. The method of claim 24, wherein inhibiting the subject's immune system from responding to said contained viable insulin-producing cells or tissue comprises inhibiting production of immunoglobulins and activated macrophages capable of reacting with the viable insulin-producing cells or tissue.

43. The method of claim 1, wherein the substance which inhibits an immune-system costimulation event also alters the cytokine profile of the subject so as to protect the contained cells or tissue from the subject's immune system.

44. The method of claim 43, wherein the substance increases the production of gamma-interferon in the subject.

45. The method of claim 43, wherein the substance is CTLA4Ig.

46. The method of claim 1, wherein the substance which inhibits an immune-system costimulation event binds complement.

47. The method of claim 46, wherein the substance is CTLA4Ig.

48. The method of claim 1, wherein the substance which inhibits an immune-system costimulation event does not alter the cytokine profile of the subject so as to protect the contained cells or tissue from the subject's immune system.

49. The method of claim 48, wherein the substance increases the production of gamma-interferon and IL-2 in the subject.

50. The method of claim 48, wherein the substance is CTLA4Ig.

51. The method of claim 48, wherein the substance and the containing of the viable cells within the device comrising the semipermeable membrane prevents host immune cell proliferation in the subject.

52. The method of claim 48, wherein the device comrising the semipermeable membrane is a hollow, fiber, a disc, or a sphere.

53. The method of claim 48, wherein the device comrising the semipermeable membrane is a microcapsule.